

Claims

1           1. A method in a computer system for generating executable code  
2 for a computer program, the method comprising the steps of:  
3           receiving an intentional program tree having nodes, each node  
4 representing a high-level computational construct of the computer program;  
5           for each node representing a high-level computational construct,  
6 transforming the node into an implementation of the high-level computational  
7 construct using low-level computational constructs; and  
8           for each node representing a low-level computational construct,  
9 generating executable code that implements the low-level computational construct.

1           2. The method of claim 1 wherein a high-level computational  
2 construct has a plurality of implementations of the high-level computational construct  
3 and wherein the step of transforming the node includes when the high-level  
4 computational construct has a plurality of implementations, selecting one of the  
5 implementations and transforming the node in accordance with the selected  
6 implementation.

1           3. The method of claim 2 wherein the step of selecting selects based  
2 on annotations provided by a programmer.

1           4. The method of claim 2 wherein the step of selecting selects  
2 automatically by analyzing semantics of the intentional program tree.

1           5. The method of claim 1 wherein the step of receiving an  
2 intentional program tree includes creating the intentional program tree by direct  
3 manipulation of the intentional program tree by a programmer.

1           6. The method of claim 5 including the step of receiving a new  
2 high-level computational construct and receiving an implementation of the new high-  
3 level computational construct that uses low-level computational constructs, wherein  
4 the step of creating the intentional program tree includes adding a node to the  
5 intentional program tree representing the new high-level computational construct, and  
6 wherein the node representing the new high-level computational construct is  
7 transformed using the received implementation.

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1           7. The method of claim 1 wherein each high-level computational  
2 construct has a function for transforming a node representing the high-level  
3 computational construct into a node representing an implementation of the high-level  
4 computation construct using low-level computational constructs and wherein the step  
5 of transforming the node representing a high-level computation construct includes  
6 invoking the function to transform the node.

1           8. The method of claim 1 wherein each high-level computational  
2 construct has a function for displaying a representation of a node representing the  
3 high-level computational construct.

1           9. The method of claim 1 including the step of before the step of  
2 transforming, preprocessing nodes to store indications to control the transforming to  
3 identify errors.

1           10. The method of claim 1 wherein the indications include flags to  
2 indicate a low-level computational construct that corresponds to an overloaded high-  
3 level computational construct.

1           11. The method of claim 10 wherein the step of preprocessing is  
2 performed as a background activity during the step of receiving the intentional  
3 program tree.

1           12. A computer system for generating a computer program, the  
2 computer program having a plurality of high-level computational constructs, each  
3 high-level computational construct having a behavior, the computer system  
4 comprising:

5           means for creating an intentional program tree by direct manipulation of  
6 the intentional program tree, the intentional program tree having nodes representing  
7 the high-level computational constructs of the computer program;

8           means for reducing the intentional program tree to a reduced program  
9 tree, the reduced program tree having nodes representing low-level computational  
10 constructs, each high-level computational construct having a reduction enzyme for  
11 reducing a node representing the high-level computational construct into one or more  
12 nodes that implement the behavior of the high-level computational construct, each of  
13 the nodes representing a low-level computational construct;

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- 14 means for adding a new high-level computational construct for use in  
15 creating the intentional program tree, the new high-level computational construct  
16 having a reduction enzyme, the new high-level computational construct for use in the  
17 intentional program tree; and  
18 means for generating executable code based in the reduced program tree.

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